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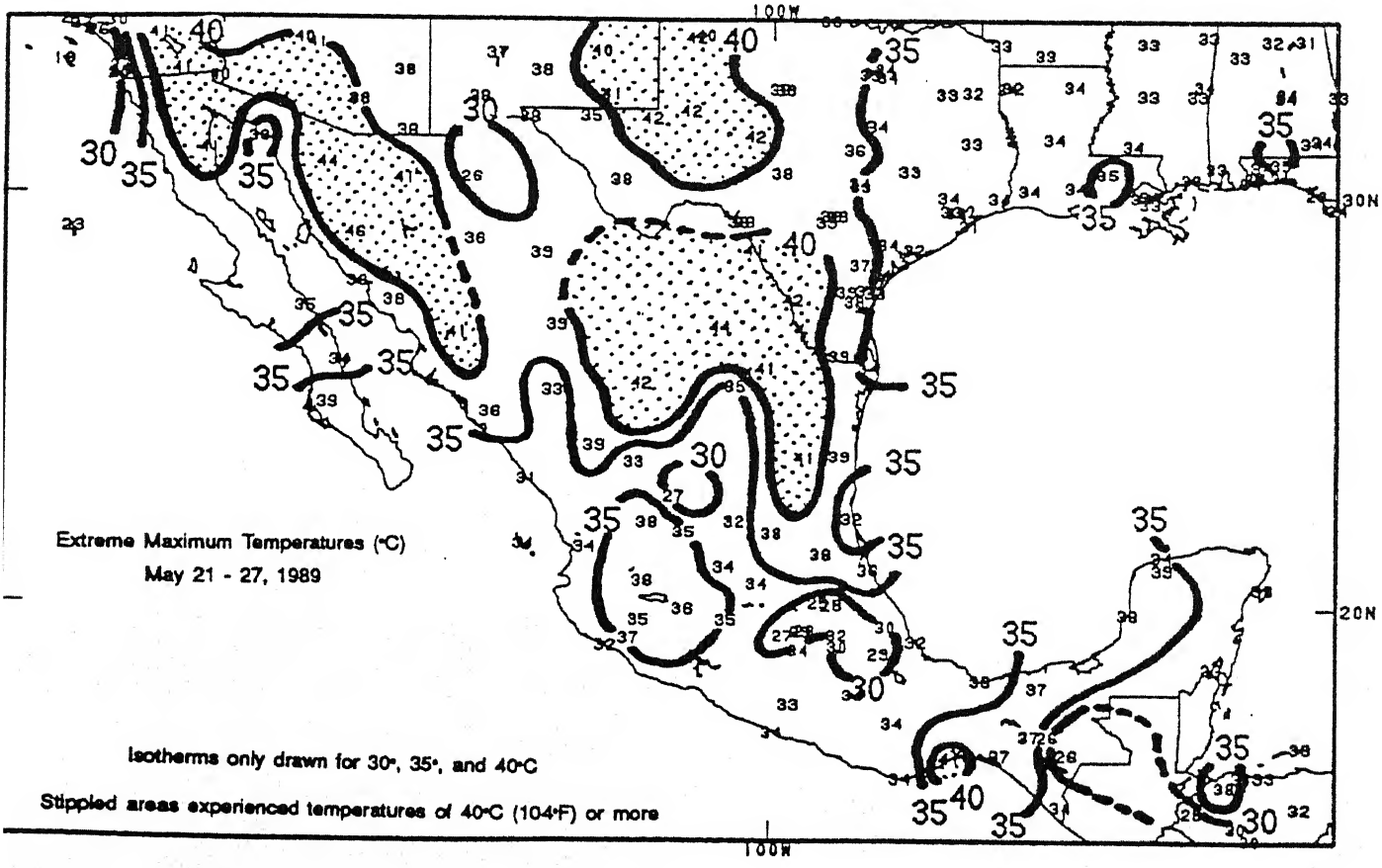
A

CLIMATE ANALYSIS CENTER

CONTAINS:
UPDATE ON
NORTH-CENTR/
U.S. RAINFALL

WEEKLY CLIMATE BULLETIN

No. 89/21 Washington, DC May 27, 1989



UNSEASONABLY HOT AND DRY WEATHER, WITH TEMPERATURES EXCEEDING 40°F (104°F), SCORCHED PARTS OF NORTHWESTERN AND NORTHEASTERN MEXICO AND WESTERN TEXAS. THE SITUATION IS EXACERBATED BY THE DELAY IN THE ONSET OF THE MEXICAN RAINY SEASON WHICH NORMALLY COMMENCES IN THE FIRST TWO WEEKS OF MAY.

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every 3 months).
- Global three month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF MAY 27, 1989

Coastal sections of British Columbia and Alaska:

PRECIPITATION RETURNS TO REGION.

, frontal system stalled along the western coast of Canada ıd brought beneficial rainfall (up to 81 mm) to the area ıt week. [Ending at 13 weeks].

North-Central United States and South-Central Canada:

RAINS BRING SOME RELIEF.

hile recent rains have been of sufficient quantity to end ɔst of the dryness in south-central Canada, amounts of ss than 10 mm have failed to substantially ease the rsistent dryness in the western Corn Belt [10 weeks].

Eastern United States:

WET CONDITIONS PERSIST.

ɔderate precipitation continued over most of the region ıile isolated heavy rains approaching 149 mm caused oding in the eastern Ohio Valley (See US Weekly Climate ghlights and Special Climate Summmary). [4 weeks].

Eastern Mexico and Southern Texas:

HEAT WAVE DEVELOPS.

treme heat invaded the area as temperatures approached °C and averaged as much as 6°C above normal. [2 eks].

5. Turkey and Syria:

AREA REMAINS DRY.

Warmer than normal conditions and precipitation less than 5 mm exacerbated parched conditions over the region. [11 weeks].

6. Manchuria and Southeastern Soviet Union:

SPOTTY SPRING RAINS.

Precipitation that normally begins in the spring and reaches a maximum during the summer months has been scattered and generally subnormal as less than 20 mm fell during the past week (see Special Climate Summary). [4 weeks].

7. Southeastern and Southern Asia:

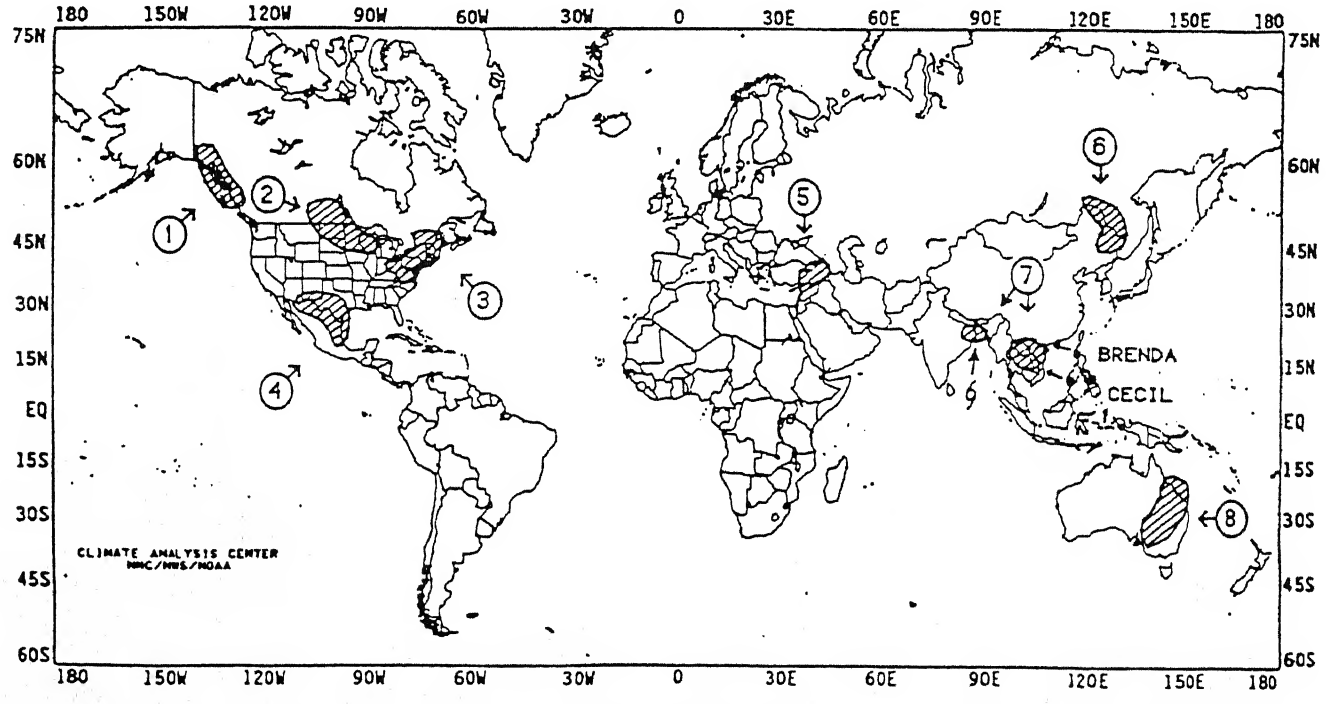
TROPICAL STORMS DUMP HEAVY RAINS.

Widescale property damage was reported in northeastern India and Bangladesh as a tropical storm moved onshore while eastern Vietnam encountered the brunt of Typhoon Cecil. According to press reports, nearly 500 mm of rain fell in parts of Vietnam. The typhoon tracked westward into Thailand and Burma where rainfall of between 100 mm and 200 mm was common. [Episodic event].

8. Eastern Australia:

WET CONDITIONS PERSIST.

Even though precipitation diminished in comparison to prior weekly amounts, above normal rainfall (up to 71 mm) fell across the region. [11 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF MAY 21 THROUGH MAY 27, 1989.

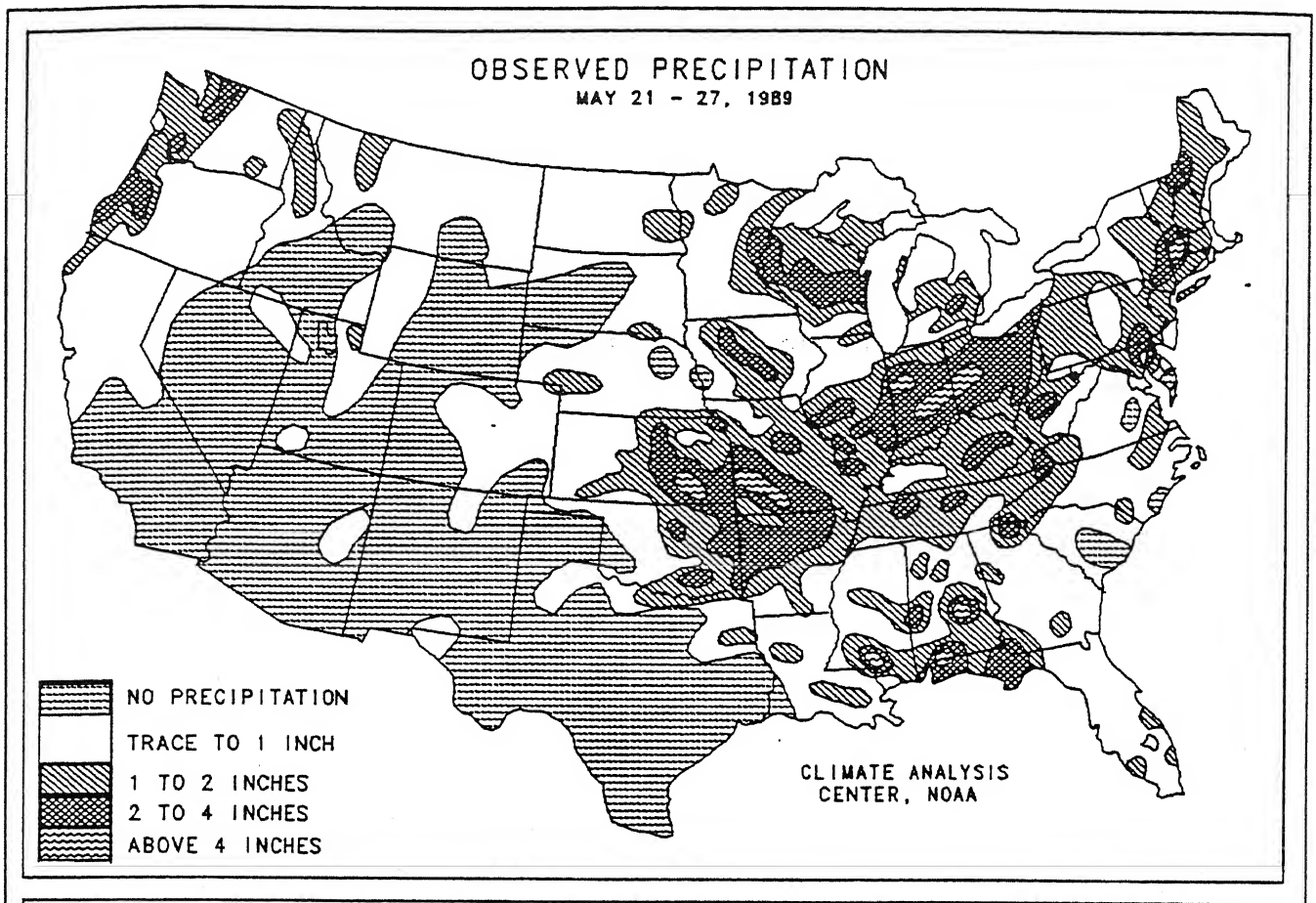
Two cold fronts provided beneficial rainfall to areas with long-term precipitation deficits, namely the northern and central Great Plains, upper Midwest, and western Corn Belt, and dumped additional precipitation on portions of the already-saturated Ohio and Tennessee Valleys and eastern New England. As the week commenced, strong thunderstorms preceding a cold front located over the nation's midsection inundated parts of southwestern Missouri with up to 4.6 inches of rain in six hours while severe weather produced tornadoes in Nebraska and Kentucky. As the front moved off the East Coast on Tuesday, moderate rains fell on most of New England and the mid-Atlantic. Later in the week, a second cold front produced numerous thunderstorms across the northern Great Plains and upper Midwest. The front eventually stalled in a position from northeastern Oklahoma eastward to northern Ohio, allowing much of the middle Mississippi and Ohio Valleys to be repeatedly hit by intense thunderstorms. In addition to damaging winds, large hail, and flash flooding, more than 35 tornadoes were spawned in Illinois, Indiana, and Ohio. Farther south, a flat, upper-level ridge of high pressure kept the southern tier of states warm and generally dry, although scattered showers and thunderstorms dropped heavy rain on a few isolated locations. In the Pacific Northwest, an upper-level disturbance brought moderate rains to coastal sections of Washington and Oregon and heavy snows (up to a foot) in the higher elevations of the Cascade, northern Sierra Nevada, and northern Rocky Mountains.

According to the River Forecast Centers, widespread moderate to heavy precipitation (generally between 2 and 5 inches) was reported from eastern Kansas and Oklahoma eastward to western Pennsylvania and West Virginia (see Table 1). Up to 9.3 inches were recorded in southern Indiana while parts of western Ohio, southeastern Illinois, and southwestern Missouri received over 5 inches. Wet weather continued in southern New York, Connecticut, and western Massachusetts as many stations measured more than 2 inches of rain. Heavy amounts were also observed across central Wisconsin and Iowa, northern Tennessee, Delaware, and along portions of the Pacific Northwest and central Gulf Coasts. Light to moderate amounts occurred along the northern half of the Pacific Coast, in the extreme northern areas of the Rockies and Great Plains, the central Great Plains, and throughout most of the eastern half of the country. Little or no precipitation fell along the southern half of the Pacific Coast, on the southern two-thirds of the Intermountain West and Rockies, the southern Great Plains, and in sections of the lower Mississippi Valley, eastern Carolinas, and western Florida. The Hawaiian Islands and the southeastern Alaskan coast generally recorded light to moderate precipitation, the latter area receiving some relief from long-term dryness.

Most of the contiguous U.S. experienced above normal temperatures, a direct contrast from the previous three weeks. The greatest positive temperature departures (between +8°F and +10°F) were reported from southeastern New Mexico eastward to southeastern Texas in association with the heat wave in northern Mexico (see front cover), while temperatures averaged more than 5°F above normal across the southern tier of states (see Table 2). In contrast, an upper-level trough of low pressure brought unseasonably cold weather to the northern Intermountain West and northern Rockies as temperatures averaged 6°F to 8°F below normal (see Table 3). Parts of the lower Missouri and middle Mississippi Valleys observed slightly below normal temperatures in response to frequent cloudiness and precipitation. Near normal temperatures prevailed throughout Alaska and Hawaii.

TABLE 1. Selected stations with 2.50 or more inches of precipitation for the week.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
DAYTON, OH	5.88	APALACHICOLA, FL	3.57
SPRINGFIELD, MO	5.82	NEW YORK/KENNEDY, NY	3.54
HARTFORD, CT	5.65	INDIANAPOLIS, IN	3.52
HILO/LYMAN, HAWAII, HI	4.66	MT. WASHINGTON, NH	3.52
DAYTON/WRIGHT-PATTERSON AFB, OH	4.63	TALLAHASSEE, FL	2.89
LAFAYETTE, IN	4.56	PANAMA CITY/TYNDALL AFB, FL	2.79
MONTGOMERY/MAXWELL AFB, AL	4.07	FORT SMITH, AR	2.77
CHICOPEE/WESTOVER AFB, MA	3.92	LITTLE ROCK, AR	2.77
WEST PLAINS, MO	3.82	PERU/GRISSOM AFB, IN	2.77
CLEVELAND, OH	3.76	JACKSON, KY	2.55
WICHITA/MCCONNELL AFB, KS	3.58	EUGENE, OR	2.53


OBSERVED PRECIPITATION
MAY 21 - 27, 1989
NO PRECIPITATION
TRACE TO 1 INCH
1 TO 2 INCHES
2 TO 4 INCHES
ABOVE 4 INCHES
CLIMATE ANALYSIS
CENTER, NOAA

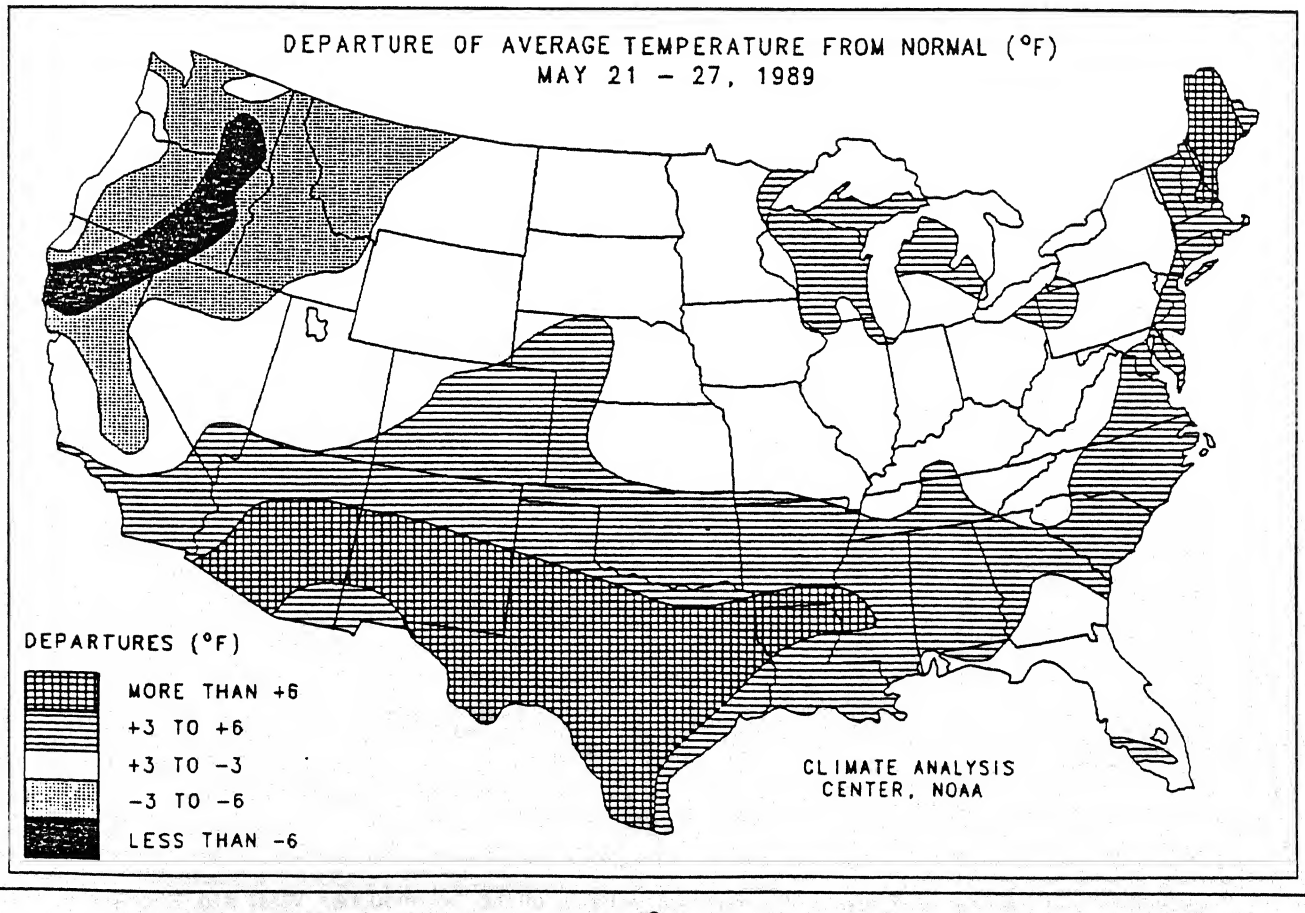
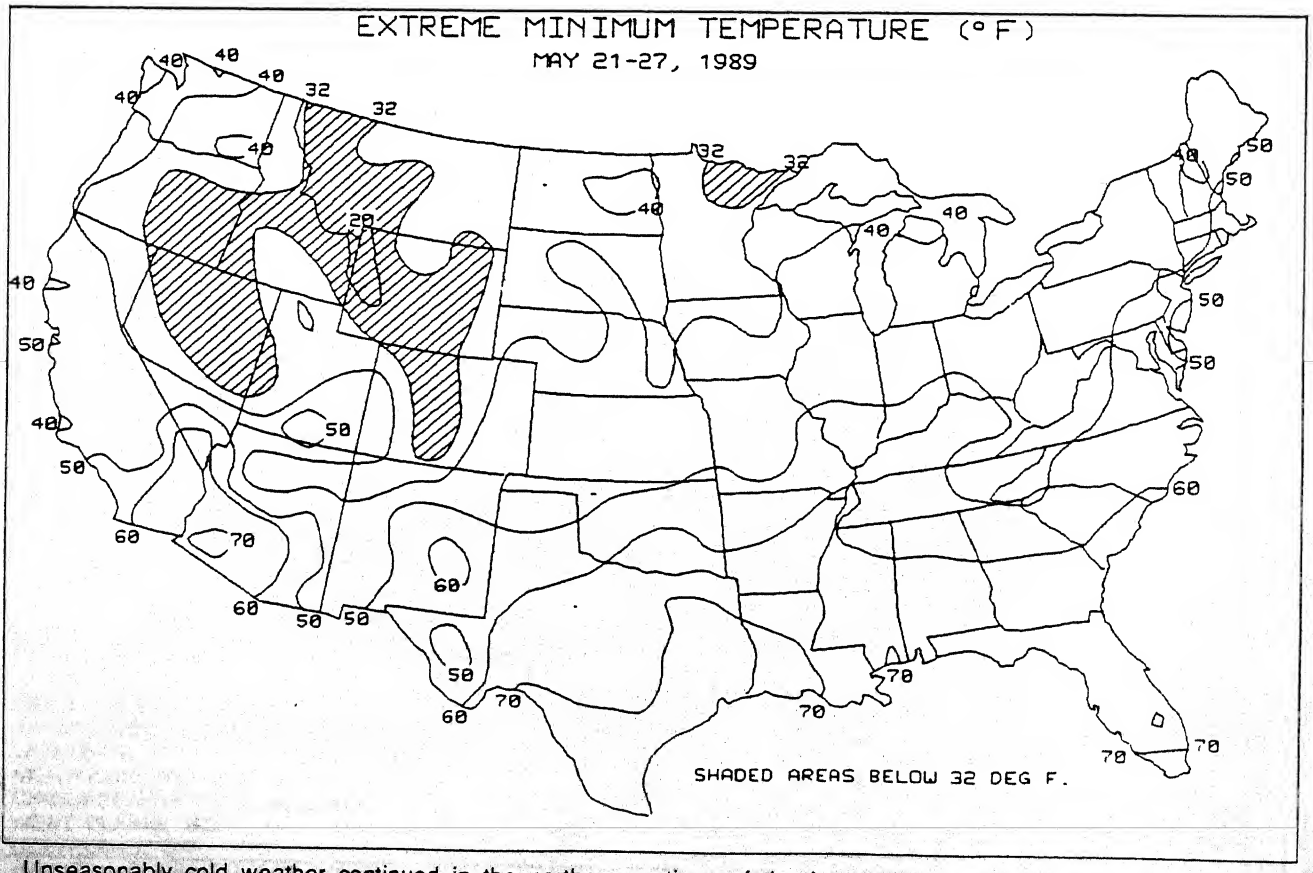

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)
MAY 21 - 27, 1989
DEPARTURES (°F)
MORE THAN +6
+3 TO +6
+3 TO -3
-3 TO -6
LESS THAN -6
CLIMATE ANALYSIS
CENTER, NOAA

TABLE 2. Selected stations with temperatures averaging 6.0°F or more ABOVE normal for the week.

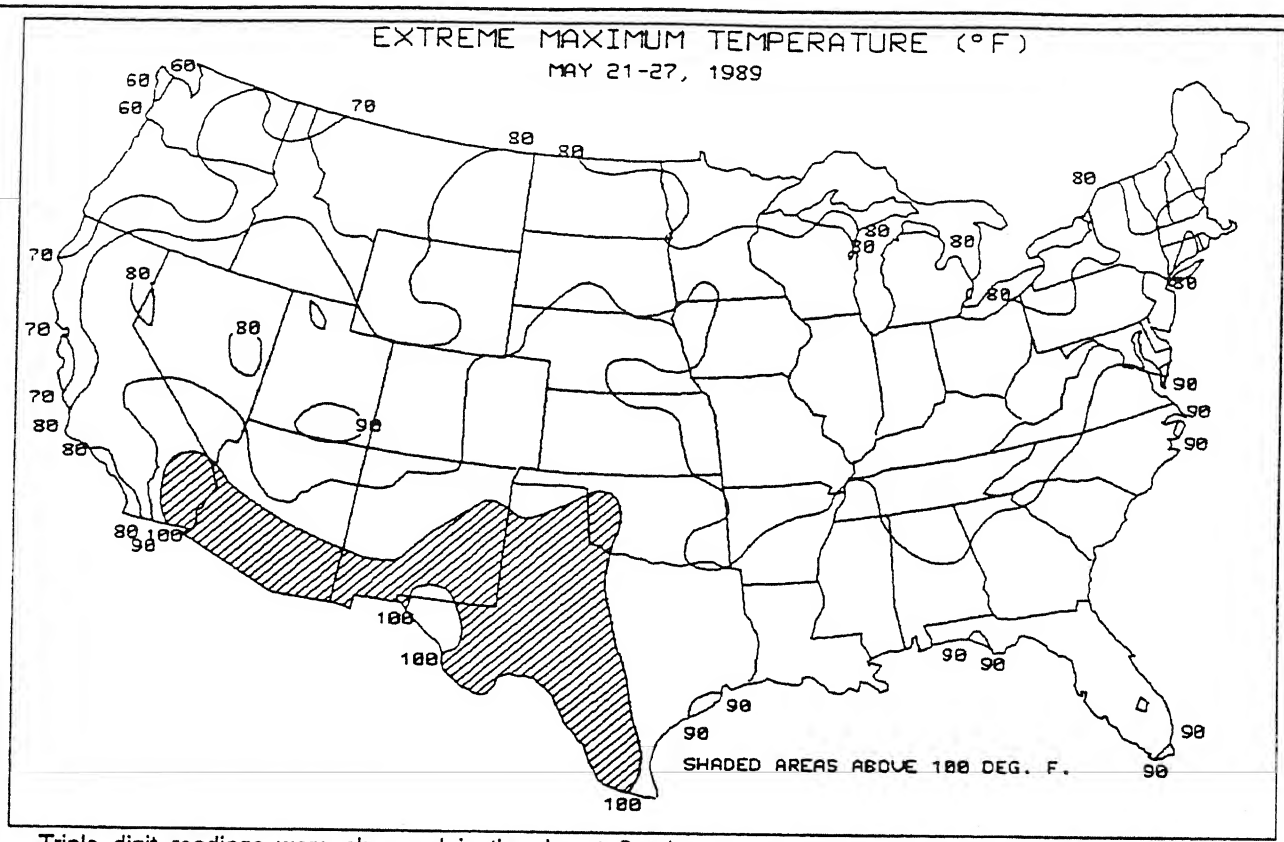
STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
MIDLAND, TX	+10.1	84.6	CLOVIS/CANNON AFB, NM	+7.0	74.8
SAN ANGELO, TX	+10.0	85.6	CARLSBAD, NM	+6.8	81.2
SAN ANTONIO, TX	+9.5	86.6	CHARLESTON, SC	+6.8	80.7
ROSWELL, NM	+8.9	80.5	PORTLAND, ME	+6.8	62.1
ABILENE, TX	+8.2	82.7	COLLEGE STATION, TX	+6.7	83.0
PRESCOTT, AZ	+8.2	67.7	RUMFORD, ME	+6.7	62.5
BEEVILLE NAS, TX	+8.1	86.4	WACO, TX	+6.6	82.9
LUBBOCK, TX	+8.1	79.3	MONROE, LA	+6.6	81.8
DEL RIO, TX	+7.9	87.0	LUFKIN, TX	+6.5	82.4
PHOENIX, AZ	+7.8	87.4	HOUSTON, TX	+6.4	83.4
CARIBOU, ME	+7.8	61.1	DEMING, NM	+6.4	75.8
ALICE, TX	+7.7	87.2	TUCSON, AZ	+6.3	82.0
HAMPTON/LANGLEY AFB, VA	+7.7	76.1	BATON ROUGE, LA	+6.1	82.6
KINGSVILLE NAS, TX	+7.0	86.4	HOBART, OK	+6.1	77.6
SHREVEPORT, LA	+7.0	81.9	ALBUQUERQUE, NM	+6.0	73.3

TABLE 3. Selected stations with temperatures averaging 4.0°F or more BELOW normal for the week.

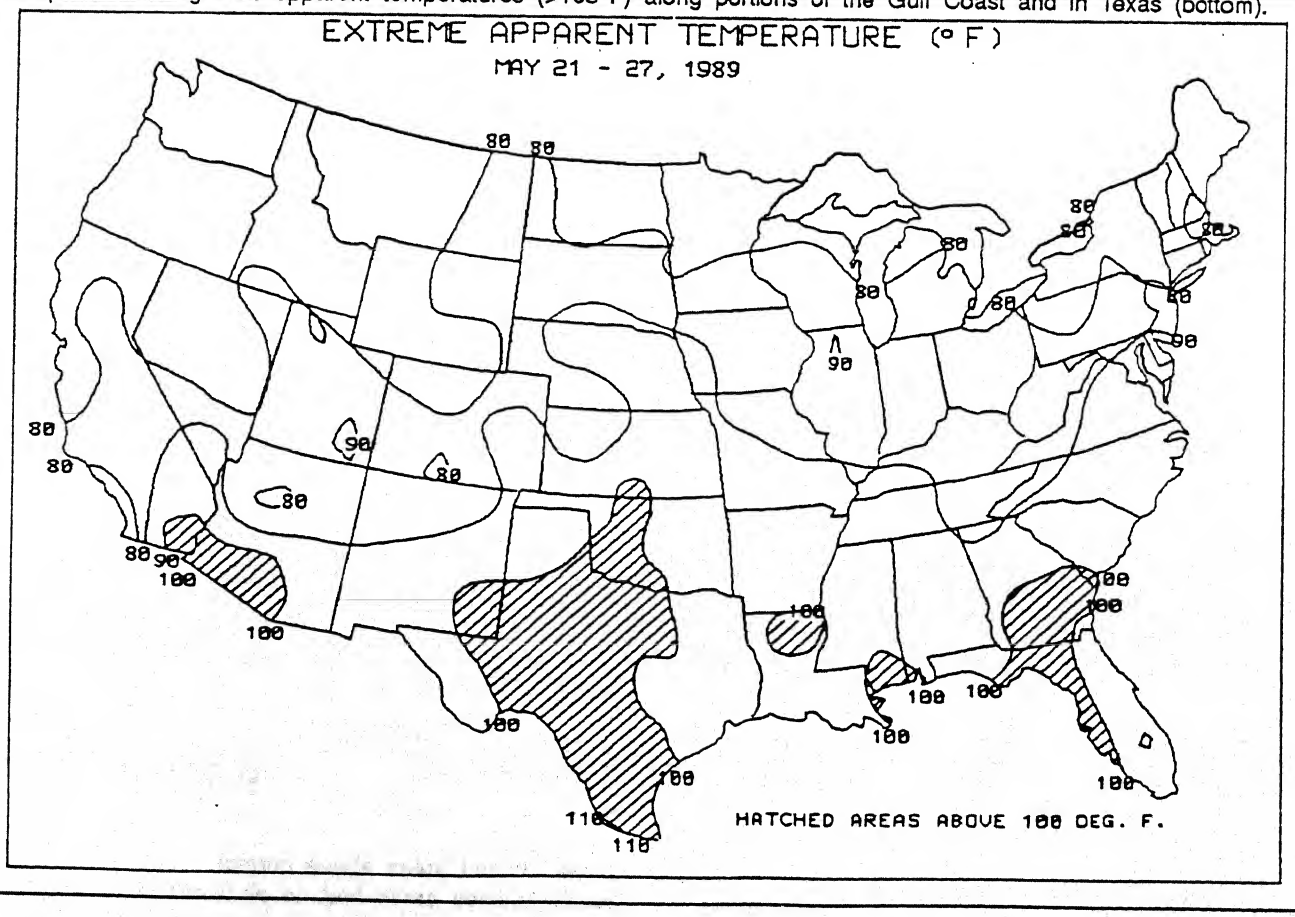
STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
REDDING, CA	-8.3	62.6	CUT BANK, MT	-4.6	47.2
PENDLETON, OR	-7.7	52.9	MEDFORD, OR	-4.3	55.3
BURNS, OR	-7.4	47.0	BUTTE, MT	-4.1	45.5
WALLA WALLA, WA	-6.6	55.4	REDMOND, OR	-4.1	48.9
WENATCHEE, WA	-6.3	56.1	KALISPELL, MT	-4.1	49.4
YAKIMA, WA	-5.5	53.9	PORTLAND, OR	-4.1	54.2
SPOKANE, WA	-5.4	50.9	SACRAMENTO, CA	-4.1	62.6
BAKERSFIELD, CA	-5.4	67.2	BETHEL, AK	-4.0	40.1
GREAT FALLS, MT	-5.0	50.7	BOISE, ID	-4.0	55.6
HAVRE, MT	-4.7	52.7			

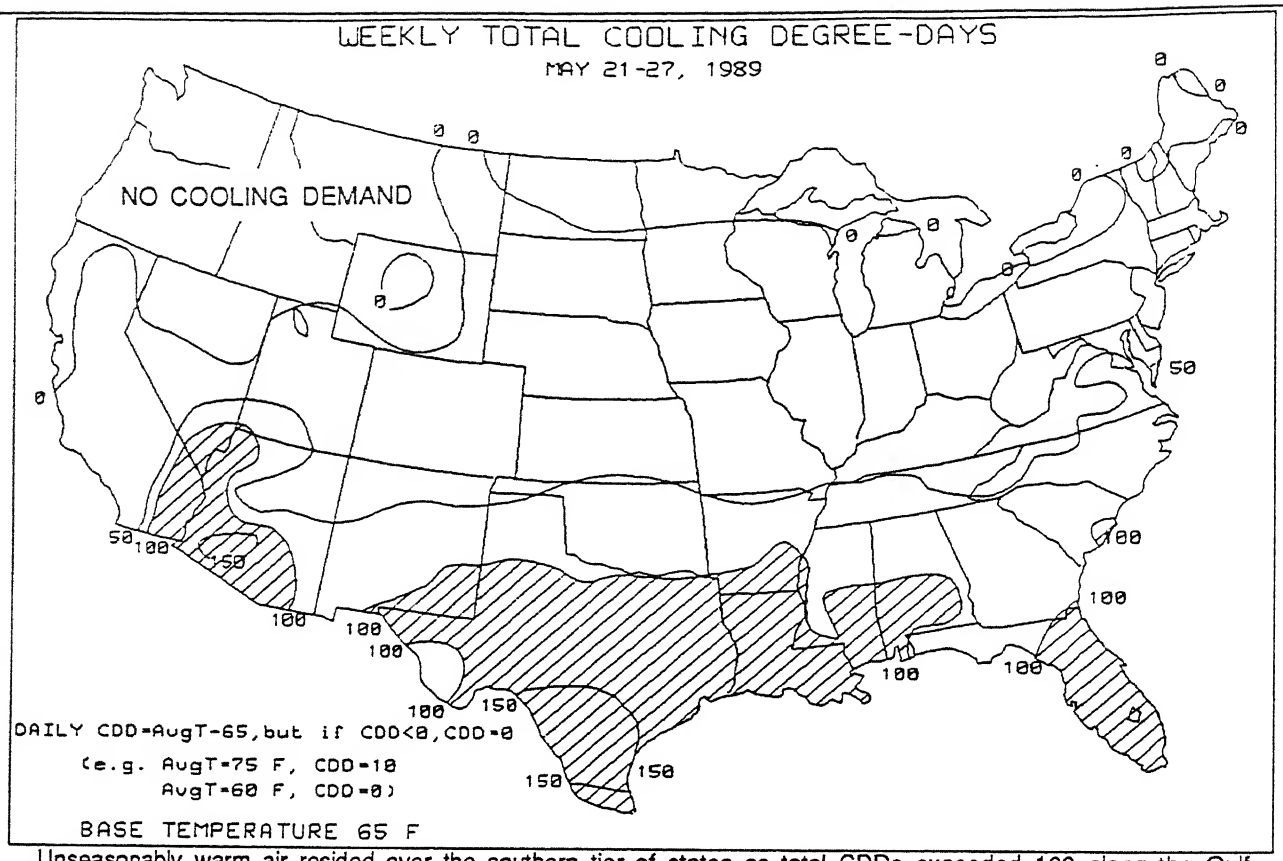


Unseasonably cold weather continued in the northern portions of the Intermountain West and Rockies for the second consecutive week as lows dipped below freezing. In contrast, warm conditions prevailed across the Deep South as minimum temperatures stayed in the sixties and seventies.

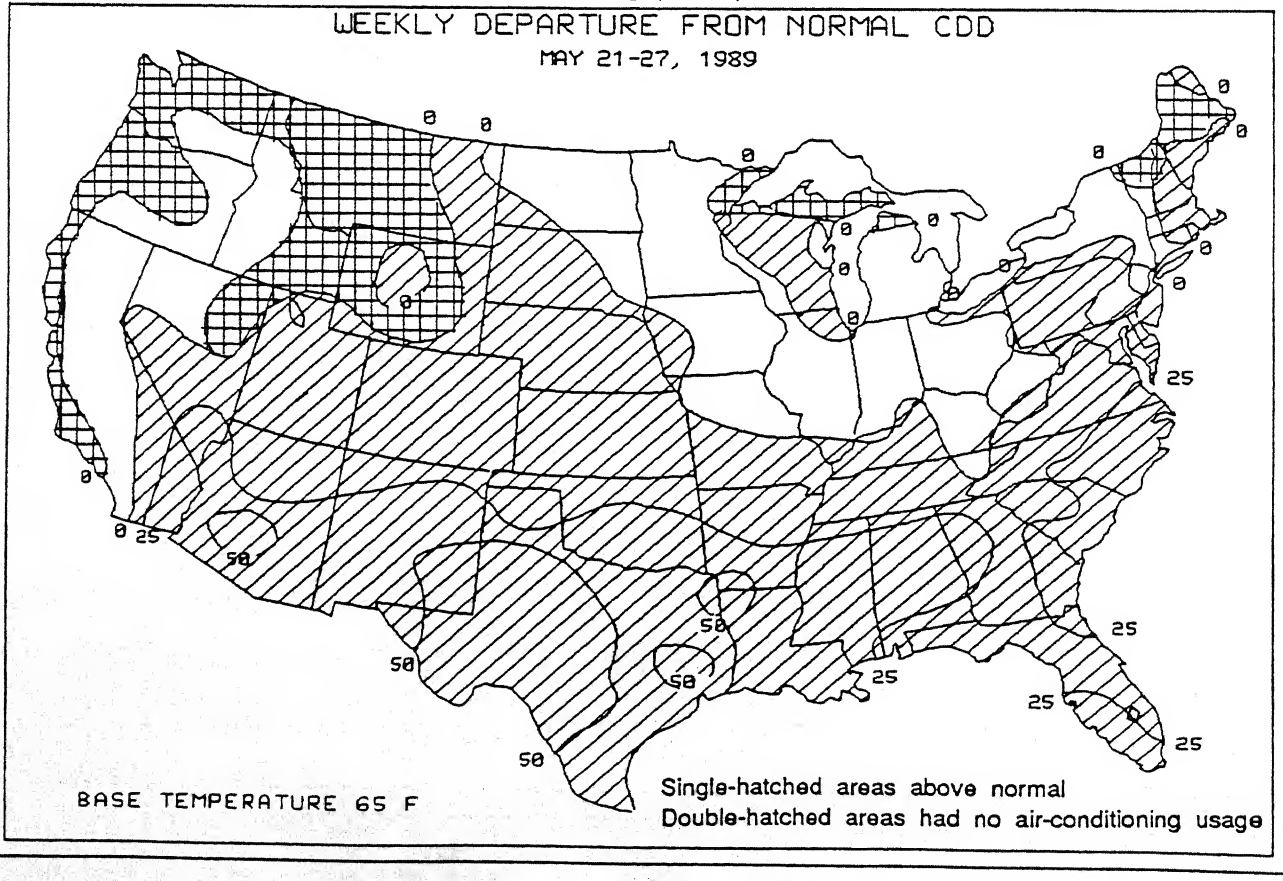


Triple digit readings were observed in the desert Southwest and western Texas in conjunction with a heat wave across most of northern Mexico (top). High humidity and temperatures in the nineties combined to produce dangerous apparent temperatures (>105°F) along portions of the Gulf Coast and in Texas (bottom).



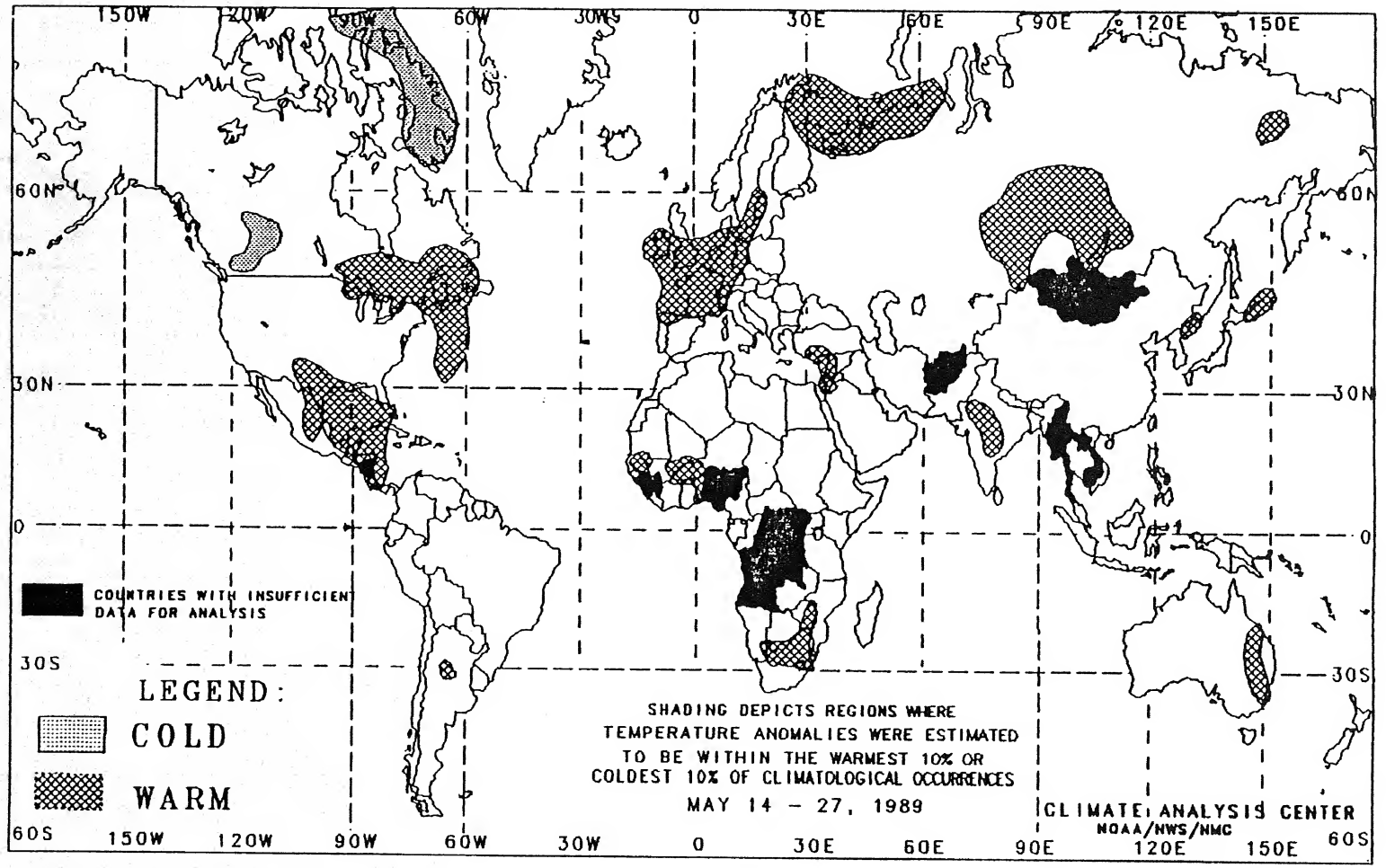


Unseasonably warm air resided over the southern tier of states as total CDDs exceeded 100 along the Gulf Coast and in the desert Southwest (top). The higher temperatures brought above normal cooling demand to the aforementioned areas as well as the central and eastern U.S. while cool weather in the northwestern part of the country required little or no air-conditioning (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

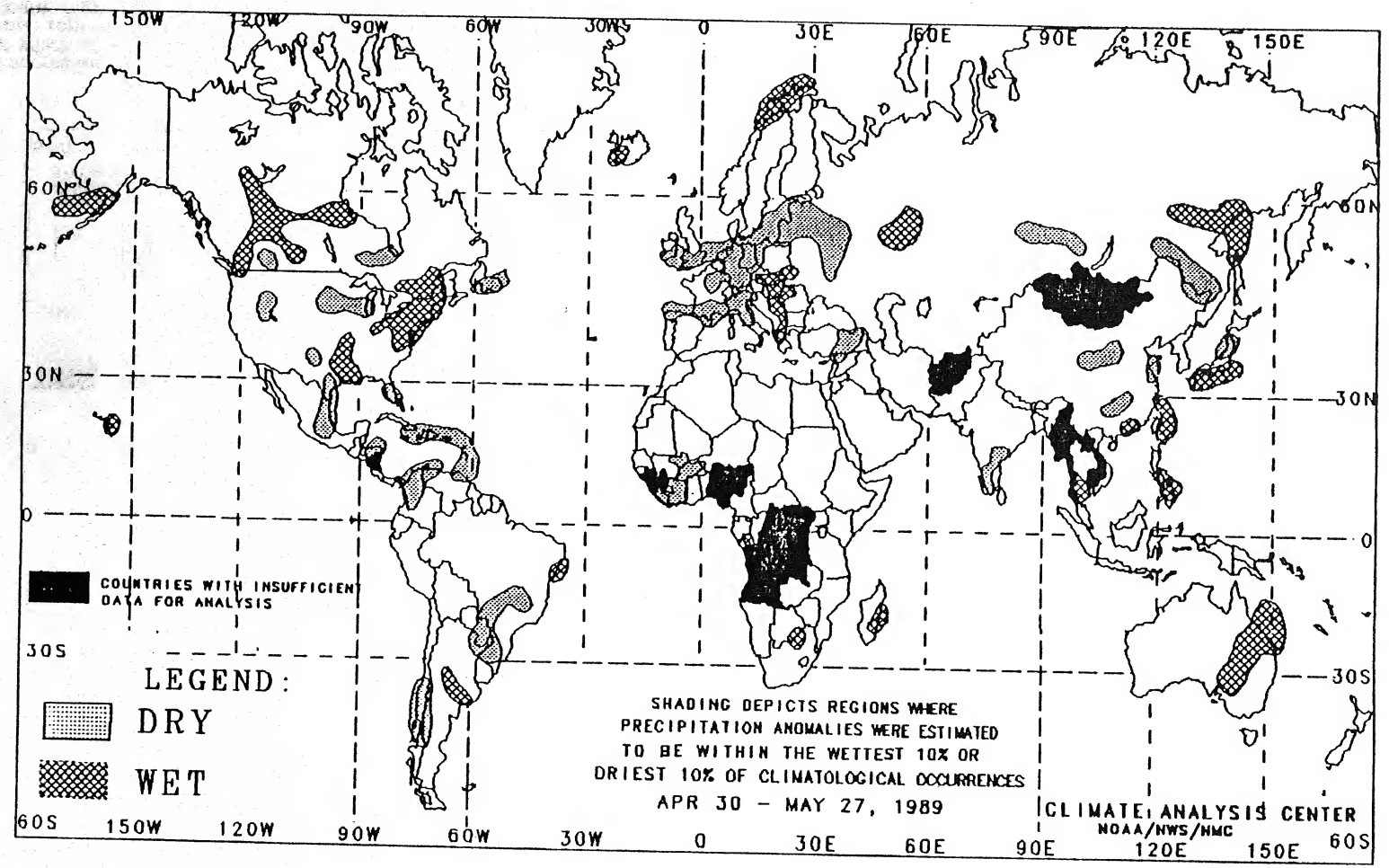
Temperature anomalies are not depicted unless the magnitute of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were recieved or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South Africa, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week predipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC
National Weather Service, NOAA

UPDATE ON MOISTURE CONDITIONS ACROSS THE GREAT PLAINS AND MIDWEST

Since the last review on both long and short-term moisture conditions in the nation's midsection (see the Weekly Climate Bulletin #89/16 dated April 22, 1989, pages 11-14), precipitation has generally increased across most of the central Great Plains and the Ohio and lower and middle Mississippi Valleys. The first substantial rains in over 8 months fell on most of Kansas and northern Missouri during May and provided some relief from short and long- term dryness (see Figure 1). Surplus precipitation during the past 5 weeks in parts of the upper Missouri and Mississippi Valleys have also improved overall moisture conditions. Farther east, however, excessive rainfall throughout most of the eastern Corn Belt has delayed crop planting (from the Weekly Weather and Crop Bulletin Vol. 76, No. 20 dated May 23, 1989, page 12) while severe flooding was reported in portions of southern Indiana and western Ohio.

In contrast, subnormal rainfall since April 23 has occurred from North Dakota and western Minnesota southward to northern Kansas and throughout most of the western Great Lakes (see Figure 2). The largest accumulated deficits (between 2 and 4 inches) during this 5-week period were found in southeastern Kansas, eastern Nebraska, northeastern Iowa, northern Illinois, and northern Michigan (figure not shown). As compared to the last published long-term Palmer Drought Index (see the Weekly Climate Bulletin #89/15 dated April 15, 1989, page 8), severe and extreme drought continued in the central Great Plains and western Corn Belt while conditions in the upper Missouri Valley had improved (see Figure 3). Nationally, near to above normal moisture conditions prevailed throughout the eastern third of the U.S. with the exception of southern Florida while severe and extreme dryness remained in the West.

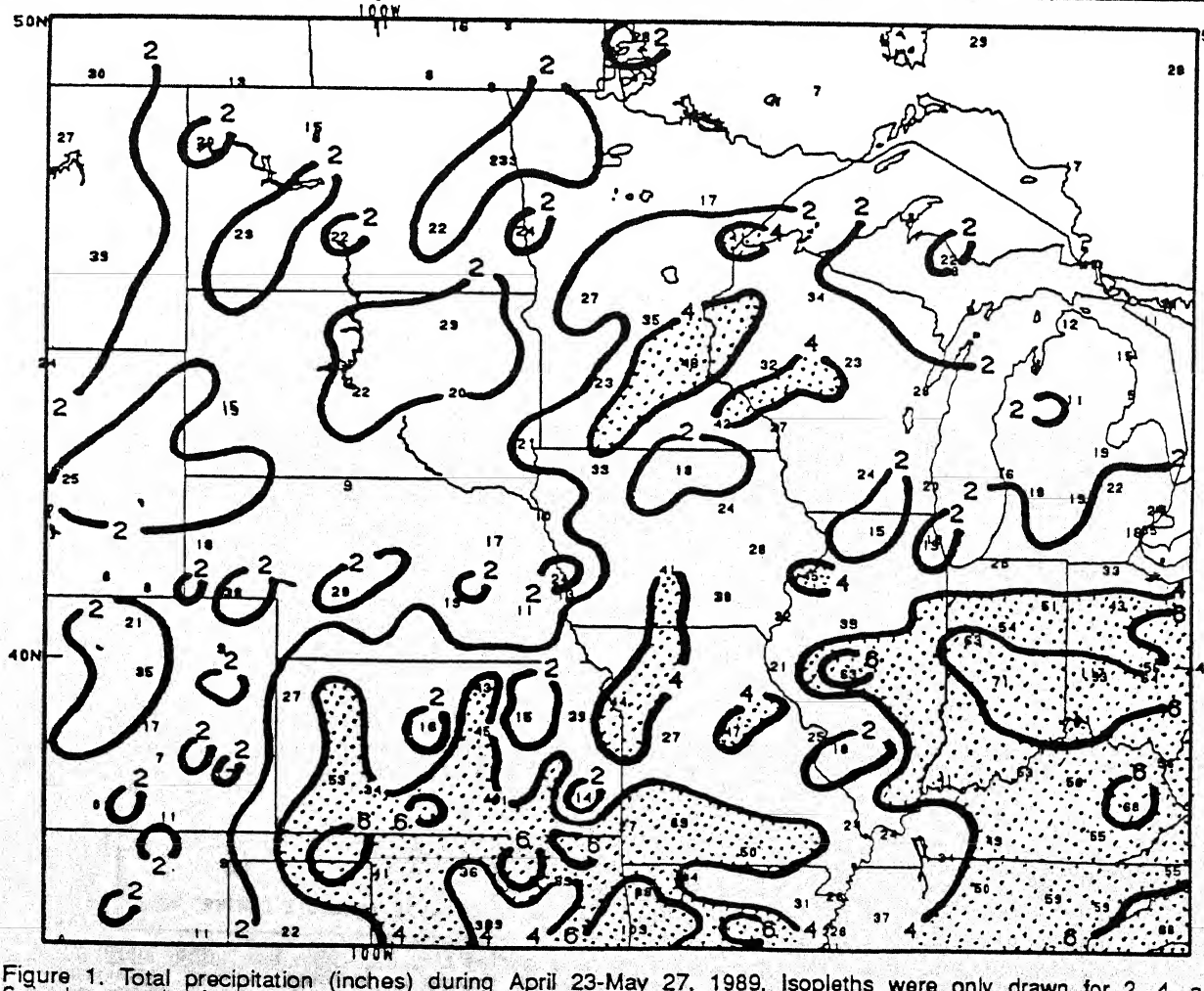


Figure 1. Total precipitation (inches) during April 23-May 27, 1989. Isopleths were only drawn for 2, 4, and 6 inches, and stippled areas are more than 4 inches. In addition to the plotted first-order synoptic and airways stations (in tenths of inches, e.g. 38 = 3.8 inches), stations from the River Forecast Centers (RFC) precipitation network were supplemented in data-sparse regions.

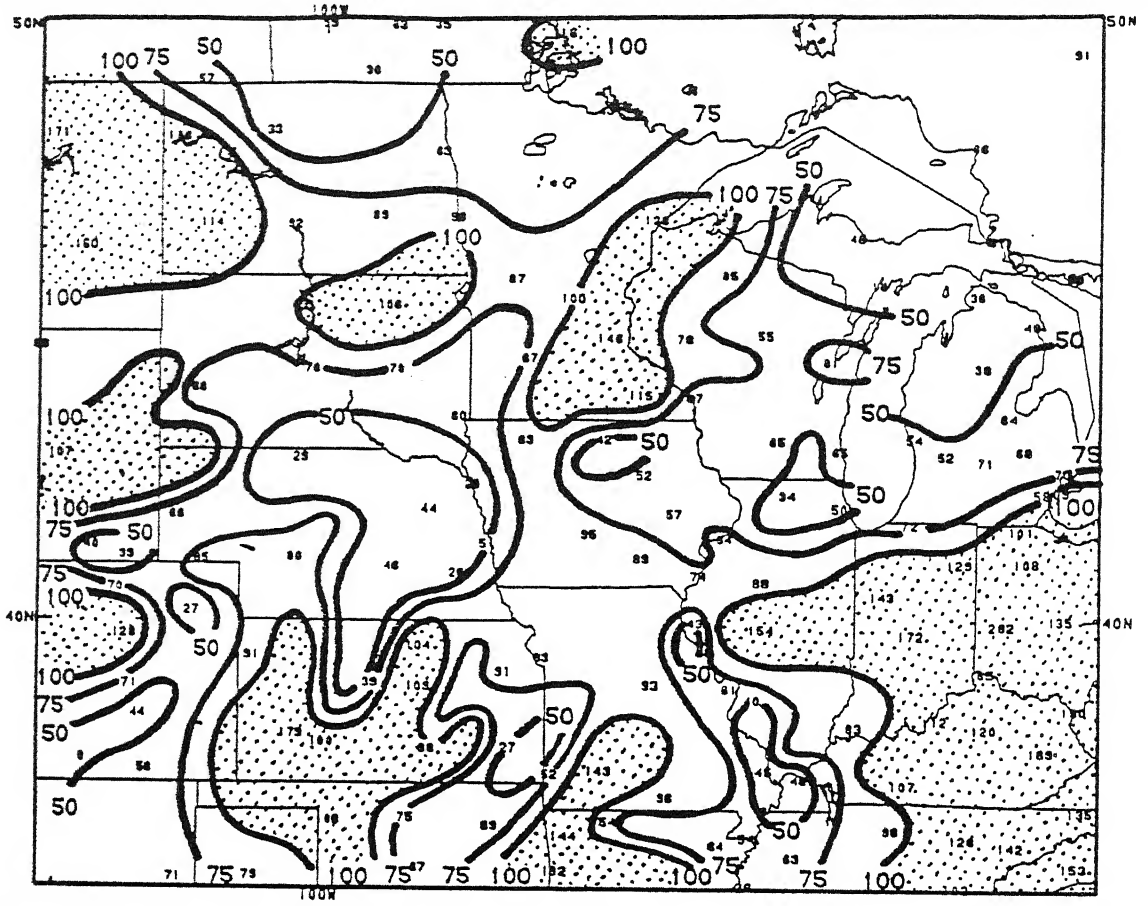


Figure 2. Percent of normal precipitation during April 23-May 27, 1989. Isopleths were only drawn for 50, 75, and 100%, and stippled areas are above normal. Contours were mainly analyzed for the plotted (first-order synoptic and airways) stations, but considerations were also given to the RFC stations (which currently do not have normals available).

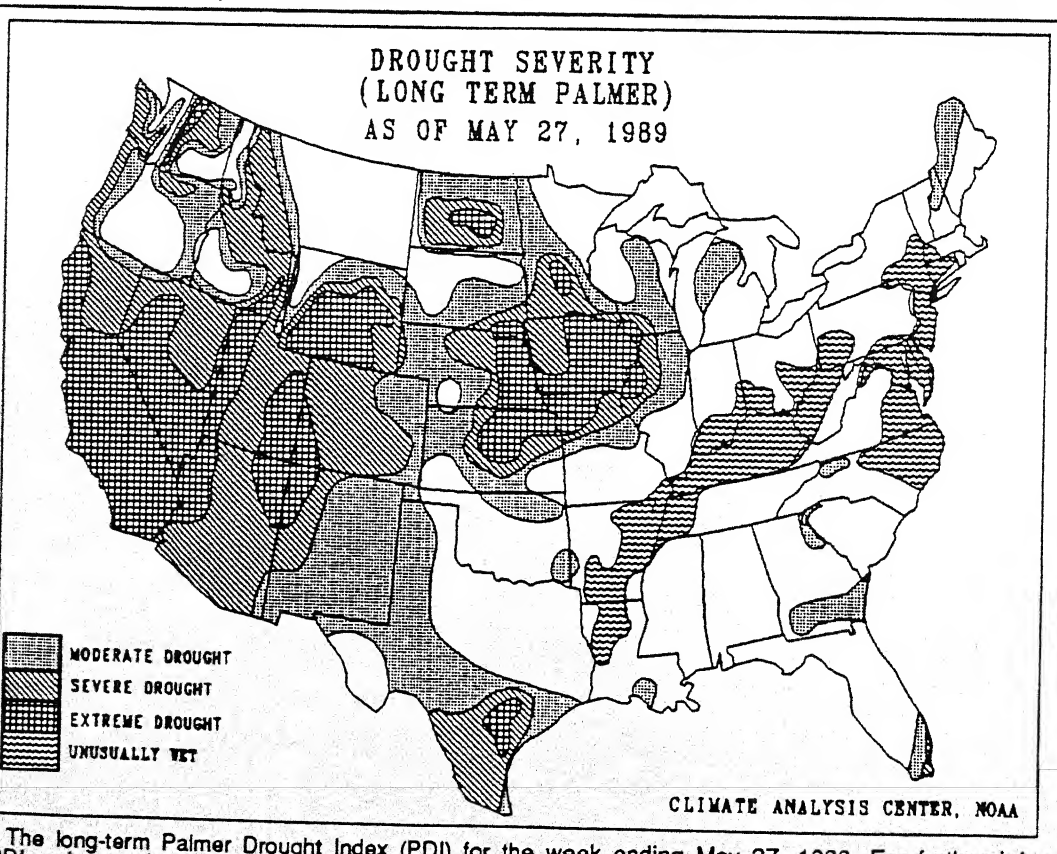


Figure 3. The long-term Palmer Drought Index (PDI) for the week ending May 27, 1989. For further information on the PDI, refer to the Weekly Climate Bulletin #89/15, page 8. Severe or extreme dryness remained in much of the West and across the central Great Plains and western Corn Belt while wet conditions were located in the Tennessee and Ohio Valleys and along the middle Atlantic Coast.

SPECIAL CLIMATE SUMMARY

Climate Analysis Center, NMC
National Weather Service, NOAA

MINIMAL PRECIPITATION AND ABOVE NORMAL TEMPERATURES HAVE AFFLICTED PORTIONS OF NORTHEASTERN CHINA

The northeastern area of China, known as Manchuria, normally receives the majority of its annual precipitation during the summer months (June-August) and minimal amounts during the winter season (December-February). Precipitation totals normally increase from north to south and from west to east.

Since last October, however, very little precipitation, even for the winter, fell on parts of Manchuria and adjacent sections of North Korea, and the usual increase in springtime rainfall had not materialized. With the exception of some light to moderate weekly precipitation (between 10 and 30 mm) in late April and mid-May, most of eastern Hebei, southern Liaoning, central Jilin, and eastern Heilongjiang provinces have observed less than 75% of the normal precipitation during the past 8 months (see Figure 1). Less than 100 mm have been measured at most stations in western Liaoning since October 1988, while larger (between 100 and 200 mm) but subnormal amounts fell on northern North Korea and eastern Liaoning, central Jilin, and eastern Heilongjiang provinces (see Figure 2). Much above normal temperatures, with departures of +2°C to +4°C since January 1, 1989, have aggravated the dryness (see Figure 3).

According to the May 2 Xinhua news release, Liaoning's dryness has been the worst in 40 years. The water stored in six major reservoirs at the end of April was 30% less than a year ago, and the flows of main rivers such as the Liaohe, Hunhe, and Taizihe were at the lowest April levels in history. The flow of smaller rivers had already been interrupted. The April 20 Jilin Daily reported that this was the most severe drought since 1949 in Jilin province. Other news sources reported that 50% of Jilin's paddy fields have no water to flood them, and the water levels in 50 large to medium-sized reservoirs were already 50% below normal. With the rapid approach of the normally wet summer months, timely and ample rains are needed to significantly ease the long-term dryness.

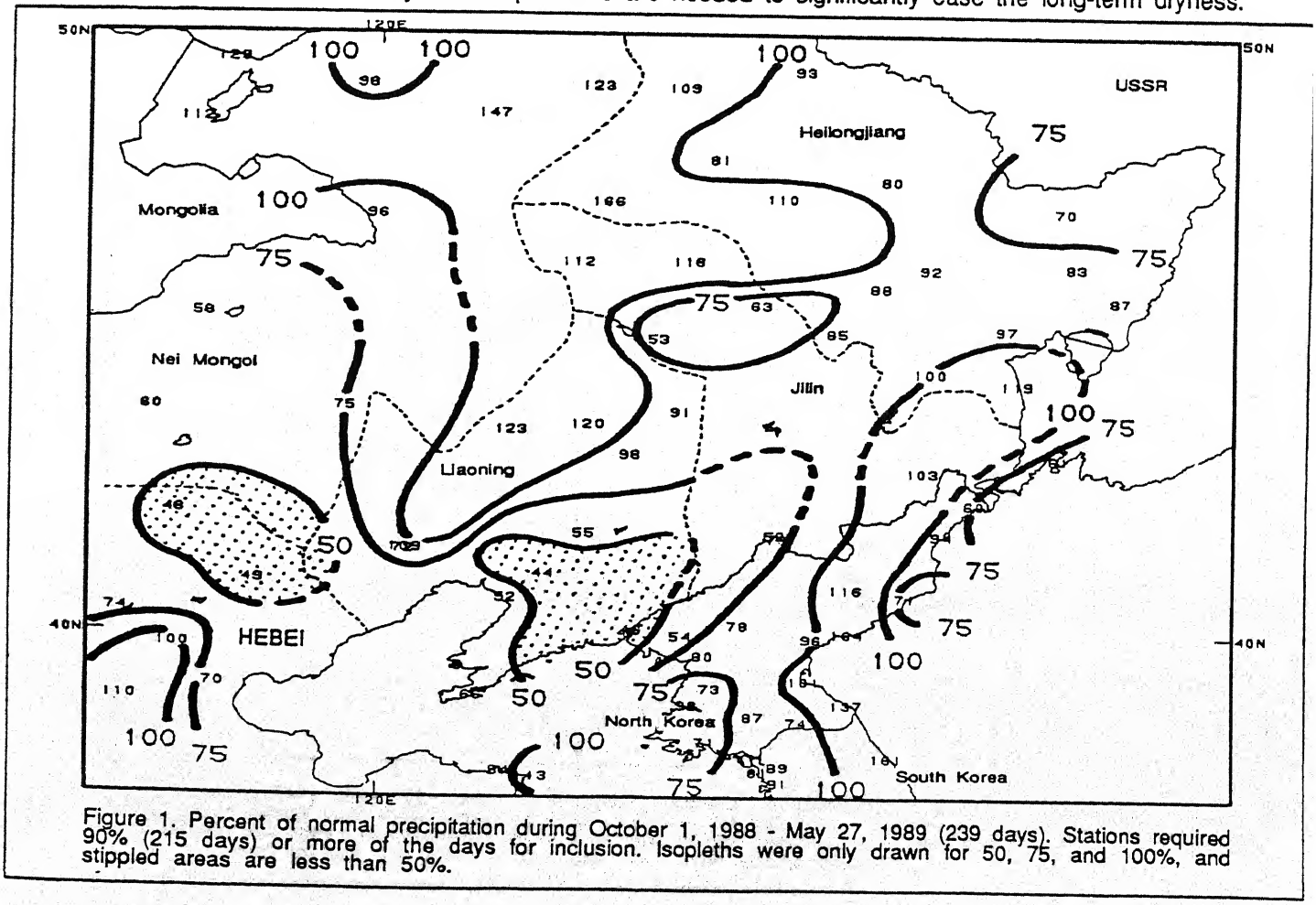


Figure 1. Percent of normal precipitation during October 1, 1988 - May 27, 1989 (239 days). Stations required 90% (215 days) or more of the days for inclusion. Isopleths were only drawn for 50, 75, and 100%, and stippled areas are less than 50%.

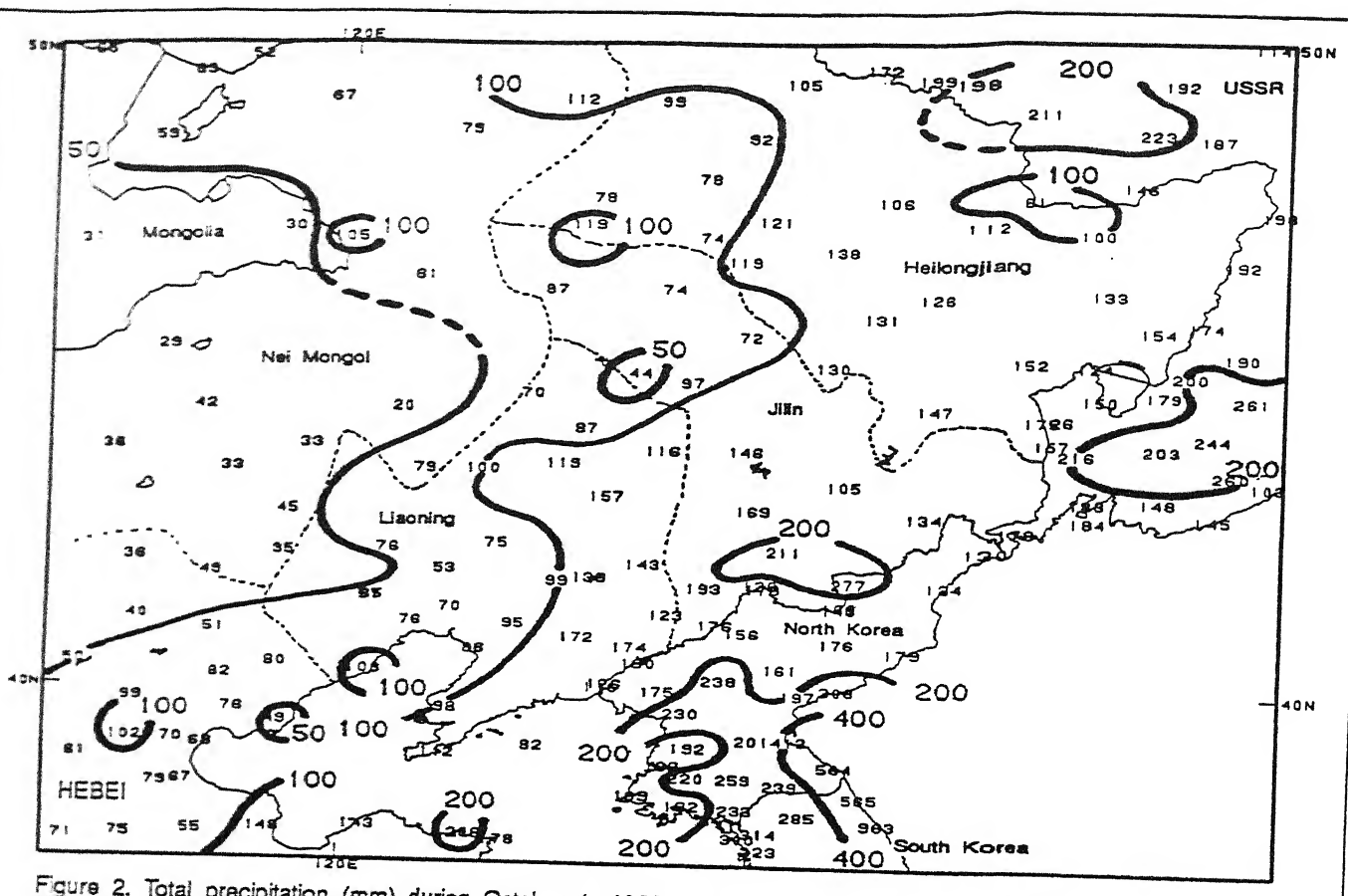


Figure 2. Total precipitation (mm) during October 1, 1988 - May 27, 1989 (239 days). Stations required 90% (215 days) or more of the days for inclusion, and isopleths were only drawn for 50, 100, 200, and 400 mm.

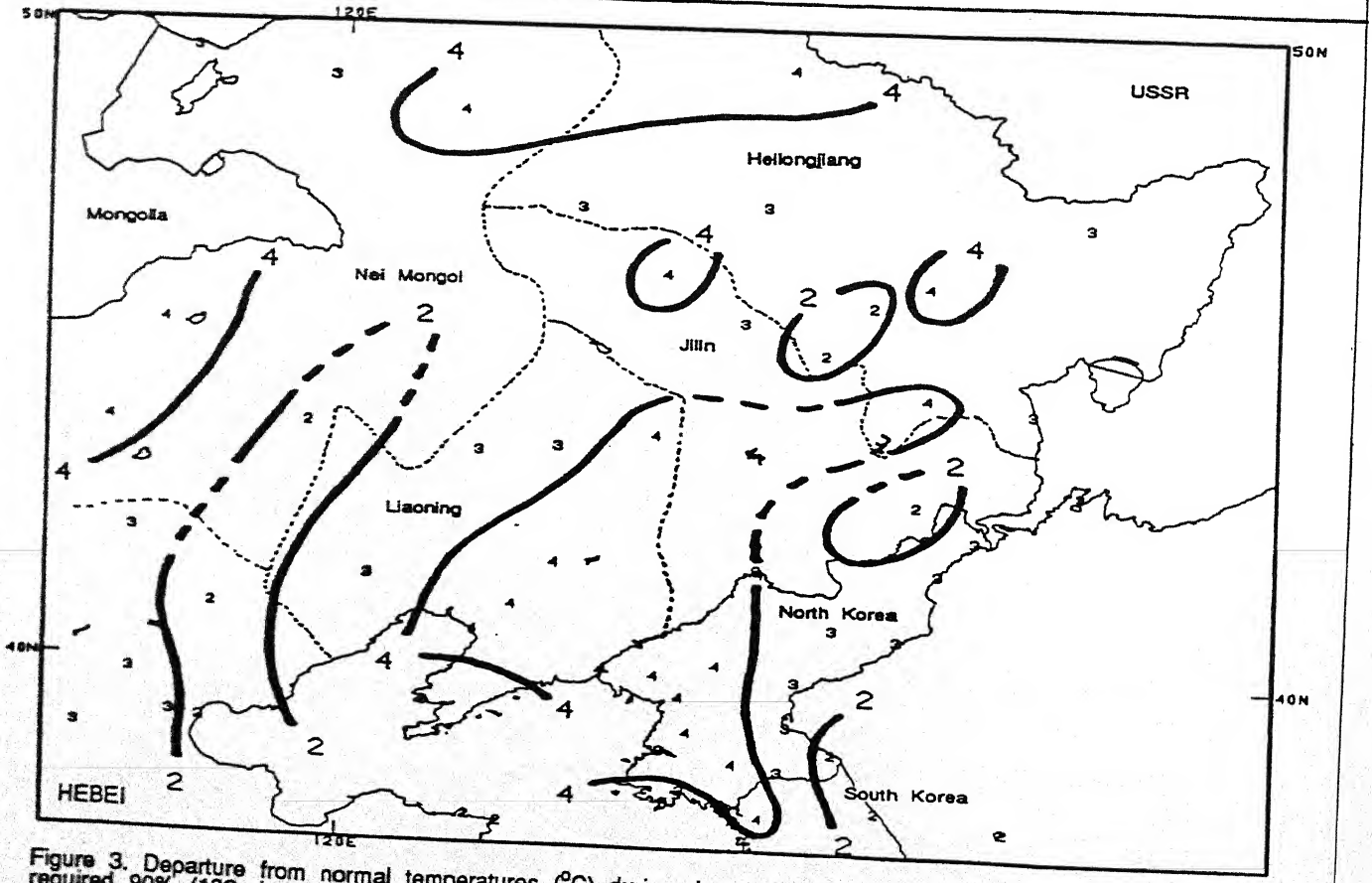


Figure 3. Departure from normal temperatures (°C) during January 1 - May 27, 1989 (147 days). Stations required 90% (132 days) or more of the days for inclusion, and isotherms were only drawn for 2°C and 4°C. Most of northeastern China has recorded above normal monthly temperatures since last fall, but the magnitude of the positive temperature departures have been the largest since the start of 1989.